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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LIE, ANGELA M	

ART UNIT	PAPER NUMBER
2163	

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/753,885	MIKKOLA, JYRKI	
	Examiner	Art Unit	
	Angela M. Lie	2163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *14* is/are allowed.

6)☒ Claim(s) *1,2,5-9 and 11-13* is/are rejected.

7)☒ Claim(s) *4 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 August 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-3, 8 and 13-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Tarvas et al (US 6252552).**

As to claims 1 and 13, Tarvas et al disclose a planar antenna for a radio device having at least one operating band (column 1, lines 65-67) comprising: a ground plane (Figure 11a, element 1107), a radiating element (Figure 11a, element 1101), a feed element (Figure 11a, element 1108) having an antenna feed point (Figure 12, elements 1206 and 1208); and a feed circuit (Figure 12, element 1207 and Figure 13) that couples the antenna feed point (Figure 12, elements 1206 and 1208) to an antenna port (Figure 12, element 1209) of the radio device; wherein the radiating element (Figure 12, element 1203) is gavanically isolated from other conductive parts of the radio device (column 1, lines 43-46), wherein the feed element (Figure 12, element 1207) is only electromagnetically coupled to the radiating element (Column 1, lines 43-46) to transfer transmitting energy to filed of the radiating element and receiving energy to filed of the feed element, and the feed circuit (Figure 13) is reactive (circuit comprises inductors and capacitors in resonance those elements are indeed reactive i.e. energy shifts

among them) and coupled the antenna feed point (Figure 12, elements 1206 and 1208) to the ground plane (Figure 12, element 1202) in order to set the at least one operating band to a desired range on the frequency axis (column 1, lines 43-46) and to match the antenna.

As to claim 2, Tarvas et al disclose a feed circuit board (Figure 12 element 1207) between the feed element and ground plane (column 7 lines 8-16, in lines 13 it is written that feed element comprises a microstrip on the surface of the connector block, this is interpreted as being a circuit board, connector is a rigid piece and it forms board while a microstrip is a part of feed circuit, so that feed circuit board is indeed placed between the feed element and the ground plane).

As to claim 3, Tarvas et al also teach a planar antenna wherein to provide two separate operating bands (column 1, lines 65-67), the feed circuit board (Figure 12 element 1207) further comprises a feed conductor which galvanically connects the feed point (Figure 12 element 1206) to the antenna port (Figure 12 element 1209), and a ground conductor which electromagnetically connects (since as shown in figure 12, elements 1206 and 1208 through which feeding and ground conductor flows are not touching each other, therefore one of ordinary skill in the art can that the ground conductor is capable of electromagnetically connecting the feed conductor to the ground plane) the feed conductor to the ground plane at an intermediate point in the feed conductor.

As to claim 8, Tarvas et al teach a planar antenna structure comprising a dielectric layer (Figure 7, element 701) above the ground plane (Figure 7, element 703),

the dielectric layer including a radiating element (Figure 7, element 702) on surface of the dielectric layer and a feed element (Figure 7, element 705) on the opposing surface thereof (as shown in figure 7).

As to claim 14, Tarvas et al disclose a planar antenna structure for a radio device having at least one operating band comprising: a ground plane (Figure 12, element 1202); a radiating element (Figure 12, element 1203); a feed element (Figure 12, element 1207); a feed circuit (Figure 13); an antenna port of the radio device (Figure 12, element 1209); and a feed circuit board between the feed element and the ground plane (column 7 lines 8-16, in lines 13 it is written that feed element comprises a microstrip on the surface of the connector block, this is interpreted as being a circuit board, connector is a rigid piece and it forms board while a microstrip is a part of feed circuit, so that feed circuit board is indeed placed between the feed element and the ground plane); wherein the radiating element (Figure 12, element 1203) is galvanically isolated from other conductive parts of the radio device, wherein the feed element is electromagnetically coupled (column 1, lines 43-46) to the radiating element (Figure 12, element 1203) to transfer transmitting energy to a field of the radiating element and receiving energy to field of the feed element, and the feed circuit is reactive (Figure 13, circuit comprised both inductors and capacitors, and in resonance those elements are reactive) and connects an antenna feed point (Figure 12, elements 1206 and 1208) in the feed element (Figure 12, element 1207) to the antenna port (Figure 12, element 1209) and ground plane (Figure 12, element 1202) in order to set the at least one

operating band to a desired range on the frequency and to match the antenna (Column 1, lines 65-67).

3. **Claims 5-7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tarvas et al (US 6252552) in the view of Kaiponen (US 6469673)**.

As to claim 5, Tarvas et al disclose all the limitations presented in claim 1, they do not teach however that the radiating element, when installed, follows the contours of the outer surface (Figure 2, element 103a) of the radio device as regards its shape and position (as shown in figure 2, element 106, note that in specification this element corresponds to the number 206). It would have been obvious to one of the ordinary skill in the art during the time when the invention was made to incorporate Kaiponen's placement of a radiating element in such a way that it follows the shape of a surface of the radio device, into the antenna as described in claim 1, because if the radiating element follows the shape of surface of the radio device, it would be one of the most efficient ways of using the space inside the radio device, and while keeping size of the device relatively small, radiating plane could still have relatively large radiating area what would lead to better radiation and receiving of a signal.

As to claim 6, Tarvas et al and Kaiponen teach all the limitations presented in claim 5. Kaiponen teaches also that the radiating element is a rigid conductive piece belonging to a cover of the radio device (as shown in figure 2, Kaiponen does not explicitly state that radiating element is a rigid component and that it is conductive, however the fact that radiating element is conductive is an inherent feature, because the

radiating element in order to radiate it has to be conductive, and in regard to radiating element is rigid, it is also obvious from the figure 2, because if radiating element (Figure 2 element 106) would not be rigid, it could not be placed in parallel with ground plane and stay separated by itself because it would unstable). The radiating element also belongs to a cover of radio device (as shown in figure 2, element 106, 103a and 103b).

As to claim 7, Tarvas et al and Kaiponen teach all the limitations presented in claim 6, Tarvas et al also teach that the conductive piece is an extrusion piece (column 8 lines 1-4, it is mentioned in this paragraph that radiating element can be a curved piece, therefore in order to make that shape it had to be extruded, if the extrusion is understood as one piece element, it is also shown in figure 11a that radiating element is one piece element).

As to claim 9, Tarvas et al teach all the limitation presented in claim 8, they do not teach however that plate formed by (understood as plate comprising) the dielectric layer, radiating element and feed element are arranged to be attached to an inner surface of a non-conductive cover of the radio device. Kaiponen teaches an arrangement in which all the part of the antenna listed above is attached to the non-conductive portion of the radio device (column 2 lines 2-26). It would have been obvious to on of the ordinary skill in the art during the time when the invention was made to mount the antenna as described by Tarvas et al by attaching it to an inner surface of a non- conductive cover as taught by Kaiponen, because placing antenna inside the housing definitely protects it from being broken or destroyed, and further the inner surface of the case should be non-conductive because a radiating element in the

antenna should not touch the conductor since that could cause degradation in the signal and even shortage (column 2 lines 24-16).

As to claim 11, Tarvas et al and Kaiponen teach all the limitations presented in claim 5. Kaiponen also teaches at least one of the radiating element (Figure 2 element 106) and feed element (Figure 2 element 207) being located inside the cover of the radio device (Figure 2 elements 103b and 103a).

4. **Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tarvas et al (US 6252552) in the view of Tarvas et al (US 6759989)**. Tarvas et al and McNamara teach all the limitations presented in claim 1, they do not teach however that the planar further comprising at least one radiating parasitic element. Tarvas et al (US 6759989) teach placing a parasitic element to improve upper operating band. It would have been obvious to one of the ordinary skill in the art during the time when the invention was made to incorporate Tarvas et al teaching and place a parasitic antenna in the antenna setup described in claim 1, because parasitic antenna increases the width of radiation and therefore it improves upper operating band and the overall signal coverage is better (US 6759989 column 1, lines 52-67 and column 2 lines 1-7).

Allowable Subject Matter

5. **Claims 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

6. **Claim 10 is allowed.**

7. The following is a statement of reasons for the indication of allowable subject matter:

As to claim 4, the Prior Art failed to disclose that the feed conductor and ground conductor are meandering strip conductors, as clearly described in the body of claim 4

As to claim 10, the Prior Art failed to disclose the radiating element being a conductive layer on an outer surface of the cover of the radio device as clearly described in the body of claim 10.

Response to Arguments

8. Applicant's arguments filed July 18, 2006 have been fully considered but they are not persuasive.

9. With respect to the applicant's assertion starting on page 7 and continuing on page 8, stating that Tarvas '552 discloses a galvanic contact being provided between the ground coupling pad and the planar radiating element and further the same conductor block providing the connection between the ground contact and ground plane, and further the applicant adds that Tarvas does not teach the connector block making connection in a galvanically isolated manner. The examiner is not certain, which connection the applicant discusses, however the only portion of the independent claims 1 and 13 that is associated with the phrase "galvanically isolated" describes the relation between a radiating element and other conductive parts of radio device. The examiner maintains that Tarvas '552, teaches all the limitations disclosed in claims 1 and 13, because as shown in figure 10, the feed pin 1003, is electromagnetically coupled to the

radiating planar 1002 (i.e. galvanically isolated), there is also no galvanic contact with the ground plane, and the feed pin is further connected to the radio apparatus (column 6, lines 5-7). According to the examiner, the structure as described above, taught by Tarvas, meets the following limitation: "a radiating element galvanically isolated from other conductive parts of the radio device", because the radiating element is galvanically isolated from the feed pin, and the feed pin is also galvanically isolated from the ground plane, and further the feed pin is connected to the radio device, so that the radio element is galvanically isolated from the other part of radio device (i.e. radio circuitry connected to the feed pin).

10. With respect to the applicant's assertion on page 8 stating that the examiner ignored part of disclosure stating that a radiating element, ground plane and ground contact are interconnected. The examiner would like to note that this portion of the disclosure was not taken into account because it a prior art (note figure 2). The lack of galavanical connection between feed pin and radiating element is also recited in column 6, lines 1-7, and this refers to the actual Tarvas's art, (i.e. figure 10). Furthermore it is very noticeable that the figure 2 and figure 10 or 12 have a different structure.

The Prior Art

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US 6683573 discloses a multi band chip antenna with dual feeding ports, it does not talk about feed circuit board

- US 2002/0089453 discloses a multi frequency band antenna
- US 5926139 discloses a planar dual frequency band antenna
- US 6404394 discloses a dual polarization slot antenna assembly

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

13. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Inquiry

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela M. Lie whose telephone number is 571-272-8445. The examiner can normally be reached on M-F.

15. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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